BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Diploma in Engineering Pearson BTEC International Level 3 Diploma in Electrical and Electronic Engineering Pearson BTEC International Level 3 Diploma in Digital Engineering Pearson BTEC International Level 3 Extended Diploma in Engineering Pearson BTEC International Level 3 Extended Diploma in Electrical and Electronic Engineering Pearson BTEC International Level 3 Extended Diploma in Digital Engineering Pearson BTEC International Level 3 Extended Diploma in Mechanical Engineering
Unit number and title	**Unit 18: Electrical Power Transmission and Distribution**
Learning aim(s)	B: Examine the design of a typical transmission network used to supply electricity
Assignment title	The construction of a typical transmission network.
Assessor	
Issue date	
Hand in deadline	
Vocational Scenario or Context	You are working as a final year apprentice technician for an electrical engineering organisation that generates and transmits electricity. Your job has so far included a range of activities that are carried out in power generation stations. Your next placement will be with the transmission side of the business. Your supervisor is pleased with your understanding of how electricity is generated and would now like you to develop your understanding of how power is transmitted safely by the network.
Task 1	You are going to examine the design decisions for an electricity transmission network. You will need to evaluate the system in order to select and justify the choice of towers and cables. **To do this:** Your tutor will give you a wiring diagram for a typical transmission network. The diagram contains details of different types of underground and overhead transmission cable, as well as towers and safety features selected by the designer. You will use this diagram to evaluate the complete transmission system to support the design decisions that have been made.

	You will first need to carry out some research into: a. a range of suitable transmission towers including i. their configuration, ii. methods of stringing and terminating cables, and iii. safety features. b. typical conductors used in overhead and underground power lines, including i. sizes and ii. the reasons why each type is used. **You then need to:** Use your research to produce a report that includes information about: a. The **towers and cables** used in the complete transmission system You need to investigate the types of transmission tower used in the network, justifying and evaluating their selection with regards to their design and configuration, methods of stringing cables, and the causes and effects of conductor ice loading and galloping. Your report should include information about the construction and use of **at least two overhead** and **two underground** transmission cables, including reasons for their use in the transmission network and methods used for jointing cables. b. Safety features and environmental concerns including methods of protection for the distribution system and techniques used to prevent trespass or theft of cables. c. Alternative approaches to the configuration of the network. You should consider alternative routings, types of transmission towers and cable types, giving reasons for your decisions.
Checklist of evidence required	A report that includes an analysis of a given transmission network, which details the relevant sections and why certain decisions have been made.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
B.D2	Evaluate the design, including safety features, towers and cables, of a transmission network, suggesting possible design improvements
B.M2	Justify the safety features given in the design of a transmission network
B.M3	Justify the choice of towers and cables used in the design of a given transmission network, making reference to the manufacturer's data sheets.
B.P3	Explain the safety features of a transmission network using both overhead and underground cables
B.P4	Describe the construction of the electricity towers and cables used in the

	design of a given transmission network.
Sources of information to support you with this Assignment	Books www.edfenergy.com/energy/nuclear-new-build-projects EDF Energy information on nuclear new build projects. www.onr.org.uk/new-reactors/faq.htm#q3 Generic Design Assessment information from the Office for Nuclear Regulation. www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/radiation/fissionrev2.shtml How power stations work. www.nei.org/Knowledge-Center/How-Nuclear-Reactors-Work Nuclear Energy Institute information on how nuclear reactors work. Websites electronics-tutorials.ws allaboutcircuits.com Further useful resources may be found at: qualifications.pearson.com/en/support/published-resources.html#step1

Note to assessor:

Task 1	General note for assessors The given design of a transmission network must provide opportunities for learners to identify design improvements to the network. For example, the number of substations could be reduced by diverting some of the demand to others as none are at maximum capacity